RESTRICTED CIRCULATION

This paper is not an official document; it is for information only and must not be quoted in any printed publication.

AGRICULTURAL MEMORANDUM NO 633

FORECASTING HAY FEVER INTENSITY IN ANY AREA

L P Smith

Hayfever forecasts have been formulated for the London area (Ag Mem 632); the present means suggest a way in which these can be extended to any area.

Severity Rating. The years of London observations can be graded as follows:-

	Seasonal Count (units of 100)	Rating	
1964	85	10	Severe
1961	64	8	Severe
1966	50	5	Moderate
1971	48	5	Moderate
1973	46	5	Moderate
1965	42	4	Moderate
1962	41	4	Moderate
1969	40	3	Moderate
1972	37	3	Moderate
1967	35	2	Low
1963	31	2	Low
1970	29	1	Low
1968	27	1	Low

Ratings 1-2 being Low
3-6 being Moderate
7 or above being Severe.

Meteorological parameters

Previous work has shown that the minimum (April and May) temperatures were of the greatest importance. The South Farnborough 1931-1960 normals are

April 4.0°C May 6.7°C

The severity ratings were analysed with respect to the deviations from these normals (d_A and d_M), with the result

$$\text{Rating} = 3.6 + 1.5d_A + 1.8d_M.$$

Ratings estimated (for any site) from this formula can be converted into forecasts of hayfever severity in the following manner.

1-1.9	Low
2-3.9	Low to Moderate
4-5.9	Moderate
6-7.9	Moderate to Severe
8 or more	Severe

Results

Year	d_A	d_M	Rating		Severity	
			Actual	Estimated	Actual	Estimated
1961	+ 2.7	0.0	8	7.7	Severe	Mod-Severe
1962	- 0.3	- 0.5	4	2.3	Moderate	Low-Moderate
1963	+ 1.2	- 0.9	2	3.8	Low	Low-Moderate
1964	+ 0.7	+ 2.2	10	8.6	Severe	Severe
1965	- 0.4	+ 0.9	4	4.6	Moderate	Moderate
1966	+ 1.0	- 0.6	5	4.0	Moderate	Moderate
1967	- 0.4	+ 0.3	2	3.5	Low	Low-Moderate
1968	- 0.9	- 0.8	1	0.8	Low	Low
1969	- 1.5	+ 0.7	3	2.6	Moderate	Low-Moderate
1970	- 1.1	+ 1.1	1	3.9	Low	Low-Moderate
1971	- 0.3	-0.1	5	3.0	Moderate	Low-Moderate
1972	+ 0.8	-0.1	3	4.6	Moderate	Moderate
1973	-1.0	+0.7	5	3.4	Moderate	Low-Moderate
1974	- 0.7	-0.4	?	1.8		Low

The success is indicated in the following matrix,

		Actual		
		Severe	Moderate	Low
Forecast	Severe	1	0	0
	Mod-Severe	1	0	0
	Moderate	0	3	0
	Low-Moderate	0	4	3
	Low	0	0	1

with the high probability that 1974 was also a successful forecast of a Low year.

The same result is obtained if seasons are rated by reference to number of days with counts over 50 and counts over 100.

Conclusions

It is thought that deviations from local normals of the minimum air temperatures in April and May could be used to forecast the hayfever intensity in any area relative to the local liability to the disease.

Any comments or suggestions on this paper should be referred to the author.

Meteorological Office
Bracknell

July 1974

"MUST NOT BE QUOTED"

Appendix

Specimen forecasts (1973)

Scotland	d_A	d_M	Rating	Forecast
Edinburgh	- 1.6	- 0.4	0.5	Low
Greenock	- 1.3	- 0.6	0.6	Low
North East				
Durham	- 0.9	+ 0.7	3.5	Low-Moderate
York	- 1.2	+ 0.2	2.2	Low-Moderate
Ilkley	- 0.5	+ 1.1	4.8	Moderate
North West				
Bolton	- 1.6	+ 0.4	1.9	Low
Midlands				
Sheffield	- 1.2	+ 0.3	2.3	Low-Moderate
Nottingham	- 0.7	+ 0.8	4.0	Moderate
Oxford	- 0.4	+ 0.9	4.6	Moderate
East				
Cambridge	- 0.7	+ 0.8	4.0	Moderate
South				
Southampton	- 0.7	+ 0.7	3.8	Low-Moderate
Bristol	- 1.0	+ 0.8	3.5	Low-Moderate
Plymouth	- 1.1	+ 0.3	2.5	Low-Moderate
S Wales				
Cardiff	- 1.0	+ 0.4	2.8	Low-Moderate

Note: The South Farnborough forecast (for London area) was Low-Moderate.